Policy Reports on Targeted Social Assistance in Ukraine

HOW TO ENCOURAGE LOW-INCOME HOUSEHOLDS TO CONSERVE GAS

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SUMMARY

- Gas used by households – directly for home use and indirectly through central heating – accounts for nearly one third of all gas used in Ukraine. Nevertheless, it is not used efficiently. A major cause of the inefficient use of gas is the lack of meters in apartments and homes. Although about 10.270 million households receive gas service, including nearly 4 million that use natural gas for heating their homes, there are only about 1.9 million gas meters is use (as of January 1, 1999). In the City of Kiev, for example, 29,900 homes are heated with gas but only 9,000 of these homes have gas meters. On January 1, 1999, a total of 27,558 residential gas meters were installed in Kyiv.
- Households that have not installed meters pay for gas based on normatives. Analysis by PADCO of residential use of natural gas (using data from households receiving housing subsidies) shows that households actually use less gas than the amount they pay for through these normatives.[1] These households, therefore, pay unreasonably high monthly payments. For households receiving housing subsidies, this "overpayment" for gas means that local budgets pay gas providers for more gas than would be the case if all households receiving housing subsidies were metered.
- PADCO's analysis shows that an average household enrolled in the Housing Subsidy Program consumes monthly between 5.7 m^3 and 6.8 m^3 of gas per square meter of living space. The average per capita consumption of natural gas for heating and cooking with and without heating water ranges from 13.0 m^3 to 13.9 m^3 and from 16.5 m^3 to 18.5 m^3, respectively.
- Data provided from households in two raions that have installed gas meters shows that actual gas consumption is between 22.76% to 29.22% below the level of gas consumption assumed in the normatives. Because gas normatives exceed gas use, local budgets must pay housing subsidy payments to gas delivery companies that are too large. PADCO estimates that between 23.09% and 28.60% of total budget funds allocated for housing subsidies are paid to gas distribution companies for gas that is NOT used by unmetered households.
- The total value of subsidies allocated for heating with natural gas during the 1997-98 heating season was 581.6 million hrn. If all households enrolled in the HSP had installed gas meters it would have been reduced to between 415.3 million hrn and 447.3 million hrn – saving between 134.3 million hrn and 166.3 million hrn of local budget funds annually.
- On the whole, Ukraine will benefit from gas conservation in a number of ways. First, the economic conditions of the population will improve since households will be able to spend saved money for other goods and services they need. Second, the budget cost of the HSP will be reduced. Third, the Government will be able to cut state subsidies for import and distribution of gas. Finally, Ukraine will need less hard currency for purchase of energy resources and will be able to increase import of other goods and services which will strengthen the hryvnya relative to other currencies.

[1] The PADCO analysis is based on data provided to housing subsidy offices by housing subsidy recipients in Kam'yanets-Podilsky raion of Khmelnytska oblast and Yahotinsky raion of Kyivska Oblast. PADCO thanks the staff in these local offices for their cooperation in this study.

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1. WHY UKRAINE MUST ENCOURAGE HOUSEHOLDS TO INSTALL GAS METERS

1.1 Overview of Gas Consumption in Ukraine

In 1998, Ukraine used about 71.1 billion cubic meters (m^3) of natural gas (5.3 billion m^3 less than in the preceding year)– of which 24.3 percent (or 17.3 billion m^3) was provided by domestic gas suppliers while the rest was imported from either Russia or Turkmenistan.[2]

The problem of providing Ukrainian customers with natural gas is a large economic burden. During the years of independence, extraction of gas in Ukraine was has fallen by 38.4 percent, and today Ukraine ranks only 25th in the world by volume of gas extraction.

Ukraine has to solve the gas provision problem primarily through importing natural gas, which costs Ukraine some $5 billion in hard currency annually. Larger importers of natural gas are the USA and Germany. Between 1996 and 1998 natural gas accounted for 20 percent to 25 percent of the total cost of imports to Ukraine.

Today, Ukraine is the leader by volume of gas transit through its territory: the annual input capacity is 290 billion m^3 and the output capacity (to countries of Western, Central, and Eastern Europe, Moldova, and Southern Russia) is almost 170 billion m^3. According to existing agreements for 1999, Ukraine is to ensure transit 110 billion m^3 of Russian gas to Western Europe, 3 billion m^3 to Moldova, and 24 billion m^3 to Southern Russia. Gas pipelines total to 1,147 km, 770 km, and 260 km for these purposes, respectively.[3]

Ukraine receives about 30 billion m^3 of natural gas from Russia as payment for the transit of Russian gas for European customers through Ukraine. With the completion of new pipelines that bypass Ukraine ("Yamal–Europe"), however, this payment will begin to decline. Therefore, Ukraine faces a growing problem to pay for its huge imports of energy. As much as one half of Ukraine's hard currency received from foreign credits and from exporting goods is used to pay for the nation's energy imports.[4]

Finding ways to reduce energy consumption is, therefore, vital if Ukraine is to reduce its growing indebtedness and to be able to use its foreign currency to import modern equipment and technology to revive economic activities. Fortunately, there are many opportunities to reduce energy consumption because Ukraine uses energy inefficiently in all sectors of the economy. This report describes the benefits from and how to encourage the more rapid installation of meters by residential customers for natural gas.

1.2 Ukraine Uses Energy Inefficiently

Most industrial and urban development in the former Soviet Union since the end of the Great Patriotic War was predicated on the availability of cheap natural gas and oil. However, the situation has radically changed today. The rapid increase in energy prices -- from 4-5 percent of the world price seven years ago to almost parity with world prices today -- has exerted an enormous stress on industry, on communal service enterprises, and on Ukraine's balance of payments.

Without strong incentives for customers to conserve energy, energy consumption per unit of manufactured production in Ukraine is six times higher than at similar enterprises in Western Europe. In 1990 energy consumption per $1,000 unit of GDP in Ukraine was 2.43 tons of oil equivalent whereas in Western European countries it was 0.39 tons on average, particularly, 0.31 tons in Italy, 0.38 tons in France, 0.4 tons in Great Britain, 0.41 tons in Germany, 0.45 tons in Netherlands. According to the World Bank, per capita consumption of energy in Ukraine – expressed in kilograms of oil equivalent is 3,180 kg, while in Poland, Spain, and Italy it is 2,401 kg, 2,458 kg, and 2,707 kg, respectively.

In Ukraine, "blue fuel" accounts for an inadmissibly high portion of initial energy consumption – 45 percent –twice as much as in Europe (21 percent) and in the world on the whole (25 percent). It is worth noting that during the last nine years the natural gas portion in the fuel and lubricant consumption pattern grew steadily from 28.2 percent in 1990 year to 37.8 percent in 1995 and up to 43.6 percent in 1998. Ukraine comes sixth in the world by gross gas consumption (after the USA, Russia, Germany, Great Britain, and Canada) and first in per capita gas consumption.

The residential sector accounts for about one third of all gas consumed in Ukraine. It also uses energy inefficiently. A few years ago, households consumed less than 10 percent of all gas in Ukraine. According to the State Committee for Statistics, 51.2 percent of

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[2] See *1998 Ukrainian Statistic Bulletin Economic Outlook, December 1998*, State Committee for Statistics, 1999.

[3] *Uryadovy Courier*, Issue 122 dated July 3, 1999.

[4] In fact, Ukraine purchases its gas through a mixture of hard currency payments and barter. The agreement between Turkmenistan and Ukraine for the provision of gas for 1999, for example, specifies that 50% of the costs will be paid through the delivery of goods, 10% through the provision of construction services, and 40% in hard currency. Despite attempts to use barter, however, the GOU is often forced to spend hard currency.

Ukrainian households reside in housing supplied with central heating, 38.3 percent of apartments are supplied hot water, and 81.7 percent of apartments are supplied with natural gas.[5] Central heating systems for residential buildings use 70 to 80 million tons of conventional fuel every year. Heating one square meter of apartment space in Ukraine uses 1.5 times more in energy than in the USA and 2.5 - 3.0 times more than in Sweden.[6] Ukraine's housing sector consumes as much gas as France as a whole does.

The experience of industrialized countries shows how current technologies allow residential energy use to be reduced by more than one-third. Installing thermal insulation and modernizing heating supply systems, for example, can lower heat loss from residential buildings. To encourage this type of conservation, Ukraine introduced new construction standards in 1994 to reduce heat loss through walls by up to 66 percent and through windows by 20% - 40%. Because the construction of new buildings is at a very low rate, however, these regulations will have a very slow impact on residential gas consumption in Ukraine.

In the short run, regulation is a less effective way of encouraging conservation than requiring households to pay for the gas they actually use. Therefore, it is necessary to install meters.

1.3 The Best Way to Encourage Gas Conservation is to Install Gas Meters

When households pay for gas according to metered use, rather than on the basis of normatives, they have a strong incentive to find cost-effective ways to reduce the amount of gas they use. In the Baltic States, for example, average residential use of gas fell by more than 30% after installing gas meters.[7] This report suggests that even larger savings will be possible in Ukraine because, today, normatives for gas use are larger than actual gas use.

Assistance in financing gas meter installation is especially important for low-income households. Purchasing and installing a gas meter may cost a household nearly $50. This sum that is beyond the means of poor households, even though the "pay-back" – in terms of saved gas consumption – will be, at most, two years for most households that use gas for heating.

The importance of gas meters to encourage gas conservation is well understood by the Government of Ukraine. In December 1997, the GOU signed an agreement with the European Bank for Reconstruction and Development under which the latter would provide credits of $80 million and a technical assistance grant of $2.4 million to support the installation of gas meters in Ukrainians homes and apartments. Progress on implementing this program, however, has been slow.

In May 1998 the Cabinet of Ministers issued Decree No. 741 «On the Procedure to Cover Expenses for Purchase and Installation in 1998 of Ukraine-made Gas Meters» which specified that:

1) Joint Stock Holding Company *UkrGas* and communal enterprise KyivGas would purchase and install one million Ukraine-made gas meters during 1998;
2) Joint Stock Company *UkrGasProm* would fund purchase and installation of gas meters at the amount of (equivalent to) $90 million received from payments for transit of natural gas through Ukraine;
3) In the first place, meters would be installed in houses where gas is used for heating, heating water and cooking;
4) Households would pay the cost of purchase and installation of meters by installments within 12 months. Households consisting only of pensioners and disabled persons with per capita income below the minimum consumption level would be allowed to repay the loan within 36 months;
5) Financial resources in special accounts of *UkrGas*, its branches, and *KyivGas,* which are not used in the current year (1998) would not be transferred to the national budget; instead, they would be used for the same purpose in the next year (1999).

Even though Decree No.741 was not implemented, the Cabinet of Ministers issued another Decree – Decree No.233 «On Installing Gas Meters by Residential Customers on a Hire-Purchase Basis» which approved "a proposal of National Joint Stock Company *NaftoGas Ukraine* to use $90 million received from selling natural gas provided as payment for gas transit for purchase and installation of gas meter on a hire-purchase basis in 1999".

Decree No.233 established conditions for meter installations similar to those provided for by Decree No.741. However, it did not clearly specify a number of meters to be purchased and installed.

Besides, Decree No.233 specified that payments by households toward repayment of loans would be deposited in a special account of *NaftoGas Ukraine* and will be used for further equipment of housing with gas meters. Funds not used in 1998 and 1999 will not be transferred to the national budget and would be used for the same purpose in coming years.

Unfortunately, even by late 1999, no information on installing meters and implementing both Decrees was available.

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[5] See *Ukrainian Housing Stock in 1998*, Statistical Bulletin, Part I, Kyiv, 1999.

[6] See *Habitat: 1996*, Report prepared by the United Nations Development Program, Kiev, 1996

[7] World Bank, aide memoire, 1996.

1.4 Current Formula for Calculating Housing Subsidies Does Not Encourage Recipients to Install Gas Meters

Under the procedures for calculating housing subsidies in effect during 1998 and 1999, any reduction in gas consumption would reduce payments from the housing subsidy program to local gas suppliers. These payments are financed from local budgets. This system creates no incentive for households to install meters. Households must buy the meters and pay for their installation. But if they cut back on gas use as a result, all the financial savings accrue to local budgets – at least for as long as the household continues to receive housing subsidies. PADCO technical assistance experts working with local housing subsidy offices have been told of many instances of households have stated that they will not install meters under these circumstances.

The issue has become very important since the Cabinet of Ministers issued Decree 619[8] in June 1996. This decree changed the normatives for gas used for home heating. Previously, households paid the same normative per square meter of living space throughout the year. Under Decree 619, households must pay for all gas used for heating only during the seven month heating season. The decree also increased by nearly 30 percent the normative amount of gas for which households without meters must pay each year. As a result of this change in normatives and billing procedures, participation in the housing subsidy program now fluctuates – falling during the summer and rising again in the winter. In summer months, an average of about 2.4 million households receives subsidies; in the winter, the average rises to 3.2 million households. Most of the 800,000 extra households receiving subsidies in the winter use gas for heating homes. Very few of these households have installed meters.

1.5 Outline of Report

Recognizing that procedures for calculating housing subsidies were discouraging households from the installing gas meters, the Cabinet of Ministers of Ukraine issued an instruction to the Ministry of Labor and Social Policy in December 1998 to develop mechanisms within the housing subsidy program to encourage gas conservation through the installation of meters. At the request of the Ministry, PADCO analyzed the use of gas among households and prepared recommendations for how to comply with this instruction.

Sections 2 and 3 of the report describe savings in gas consumption and reductions in the cost of subsidies that would result from the installation of meters by low-income households. Little is known about how much gas households actually consume in Ukraine nor about how this varies according to household structure, appliances owned, type of residence and regional location. Systematic records are not maintained by national joint stock company *NaftoGas Ukraine* or by local gas retailers. Recognizing this gap, in July 1998 the Cabinet of Ministers authorized a pilot program to collect and analyze gas consumption data to be carried out in Zaporizka Oblast, beginning in September 1998.[9] The results of this study, however, have not been published yet.

The issue of encouraging gas conservation, however, is urgent. PADCO used two databases from housing subsidy offices to make estimates of gas use and potential savings from installing meters. The first database, discussed Section 2 of this report, is from two raion housing subsidy offices where a large number of households have installed gas meters. These data are used to estimate actual gas use by households for home heating, heating water, and cooking.[10] The data from these two raions cannot be used to make projections of the nationwide use of gas among households receiving housing subsidies. Therefore, PADCO has performed a second analysis based on a representative sample of households nationwide. The second database, from 32 housing subsidy offices that participate in a pilot reporting program, is used to estimate what share of housing subsidies may be attributable to payments for gas for home heating, and water heating. The pilot raion database includes 66,000 households for whom data on actual level of services used is recorded. Based on information in this database, PADCO estimated a portion of housing subsidies to reimburse households for gas for heating housing and heating water.

Section 4 shows estimates of the "gas component" in the total cost of the Housing Subsidy Program received by extrapolation of results calculated based on information in the pilot raion database to Ukraine as a whole, thus estimating. It also reports the overall estimates of nationwide savings in billable gas consumption and in the cost of housing subsidies.

[8] Cabinet of Ministers Decree No. 619 dated June 8, 1996 «On Approving Norms for Unmetered Consumption of Natural gas by Residential Customers».

[9] Cabinet of Ministers Decree No. 1131 dated July 22, 1998 «About Introduction of Special Procedure for Calculation of Consumption of Natural Gas in Zhaporiska Oblast».

[10] Housing subsidy offices maintain these data because households must show their actual gas use to staff in housing subsidy offices in order to allow the offices to recalculate payments to local gas providers. The housing subsidy offices maintain, on computer, records of actual gas consumption by households.

Section 5 discusses effectiveness of gas meters installation. In particular, it considers specific aspects of granting subsidies to households with meter gas, analyzes principal provisions of Cabinet of Ministers Decree No. 822 on improving the procedure of granting subsidies[11], considers possible options for installing gas meters by households, and shows an example of calculating a pay back period for purchase and installation of gas meters.

[11] Cabinet of Ministers Decree No. 822 dated May 14, 1999 «On Improving the Procedure of Granting Subsidies to Reimburse Households for Expenses for Housing and Communal Services, Liquid Gas, and Solid Fuel».

2. HOW MUCH NATURAL GAS DO LOW-INCOME HOUSEHOLDS USE?

PADCO's first task was to determine actual gas consumption by households per floor area unit (for heating housing) and per capita (for heating water and cooking purposes).

2.1 Database for PADCO Analysis of Gas Consumption by Individual Households

PADCO selected housing subsidy databases maintained by two raions -- Kam'yanets-Podilsky raion (Khmelnytska oblast) and Yahotynsky raion (Kyivska oblast) – as the basis for this analysis. Both are rural raions and most households in these raions have installed meters for their supplies of natural gas. The databases maintained by the local HSOs include not only the cost of services but also detailed information on the types and volume of services provided.

Housing subsidies are initially calculated based on normatives. Normatives are defined in terms of m^3 per m^2 of heating space in the apartment for gas used for heating and m^3 per capita for gas used for heating water and cooking. But at the end of the heating season, households are required to submit their metered gas billing to the housing subsidy offices, allowing the offices to match households' actual consumption of metered natural gas using data on consumption included in each record in their databases. The housing subsidy offices then recalculate subsidies and make final settlements with service providers.

2.2 Actual Consumption of Gas in the 1997-98 Heating Season

Kam'yanets-Podilsky raion. On November 1, 1998, there were 1,975 records in the database maintained by the housing subsidy office in Kam'yanets-Podilsky raion. Of this total, 1,132 households used gas for home heating. Of these, 781 households were equipped with gas meters (69 percent). (This is a much higher incidence of metering than is typical in other raions reviewed by PADCO).[12]

The total amount of subsidies for natural gas – metered and unmetered – during the heating season was 388,946.21 Hrn. Data on actual gas consumption was verified using actual billing information from metered households during June through September 1998. Table 2.1 shows the results of these analyses.

In Kam'yanets-Podilsky raion, therefore, the fact that many households had installed meters reduced the total volume of gas for which households paid by 809,357 m^3 – 22.76 percent below what would have been estimated had households been billed according to normatives. Because households consumed less gas, the housing subsidy program paid smaller subsidies to participating households. The reduction in the costs of the subsidy program in that raion was 81,040.72 hrn (23.09 percent).

Yahotynsky raion. Similar calculations were made for the housing subsidy database of Yahotynsky raion (Kyivska oblast). On October 1, 1998, there were 10,310 records in the database; 6,649 households used natural gas for home heating, of which 4,298 apartments or houses were equipped with meters (65 percent). Table 2.2 shows results of the analysis. In Yahotynsky raion, 29.22 percent of gas and 28.60 percent of subsidy funds were saved because billing was based on actual consumption rather than on normatives.

2.3 Estimated Average Actual Gas Consumption for Different Purposes

During the October 1997 - April 1998 heating season, subsidies were originally granted and calculated based on the following consumption normatives:

- 11 m^3 per m^2 of heated floor area within consumption norms;
- 18.3 m^3 per household member for cooking;
- 23.6 m^3 per household member for cooking and heating water.

To estimate the average actual consumption of natural gas, we distinguished two categories of households:

- Households using natural gas for heating and cooking; and
- Households using natural gas for heating, cooking, and heating water.

Estimates were calculated in three steps.

In the first step, we identified volumes of gas each household consumed for heating housing and for cooking (or for cooking and heating water) based on existing normatives. Calculations were made by the following formulas:

1) Total normative gas consumption by i^{th} household: $V_{ni} = V_{oni} + V_{qni}$, where $V_{oni} = 11.0 \cdot S_i$ is the normative volume of gas used by i^{th} household for heating housing and S_i is heated floor area in m^2;

[12] We were not able to analyze consumption of gas for cooking by households whose housing was received central heating since only one such household had installed a gas meter.

V_{pni}, V_{qni} is the normative volume gas consumed by i^{th} household for cooking ($V_{pni} = 18.3 \cdot n$) or for cooking and heating water ($V_{qni} = 23.6 \cdot n$), where n is the size of i^{th} household;

2) The volume of gas used by all households (for all purposes (V_n) and individually for heating (V_{on}) and cooking (V_{pn}) or cooking and heating water (V_{qn}) is the total of respective values calculated for each household.

In the second step, we used the relationship between normative consumption for heating housing and that for cooking and heating water in order to split actual gas consumption into two components: (a) actual consumption of gas for heating housing, and (b) actual consumption of gas for cooking (or cooking and heating water).

Division into the two types of customers was achieved by assuming that the ratio between existing normatives: (a) 11 m^3 of gas (for heating housing) per m^2 of heated area to 18.3 m^3 per capita (for cooking); and (b) 11 m^3 per m^2 of heated area to 23.6 m^3 per capita (for cooking and heating water) remained unchanged. Put differently, the actual consumption of gas was calculated by the following formulas:

1) For heating: $V_o = (V_a \cdot V_{on})/V_n$;
2) For cooking: $V_p = (V_a \cdot V_{pn})/V_n$;
3) For cooking and heating water: $V_q=(V_a \cdot V_{qn})/V_n$,

where

V_a is the total volume of gas actually consumed;
V_o is the volume of gas actually consumed for heating purposes;
V_p is the volume of gas actually consumed for cooking (and not for heating water);
V_q is the volume of gas actually consumed for cooling and heating water
V_n is the total volume of gas estimated based on normatives;
V_{on} is the volume of gas estimated based on normatives for heating;
V_{pn} is the volume of gas estimated based on normatives for cooking (and not for heating water);
V_{qn} is the volume of gas estimated based on normatives for cooking plus heating water.

For the third step, we used the total floor area (S_a) and total number of households members (N) to calculate the average actual gas consumption per m^2 of heated area and actual gas consumption (for cooking and cooking plus heating water) per capita according to the following algorithm:

1) Average actual gas consumption per m^2 of heated area: $G_o = V_o / S_a$. It should be noted that the average actual gas consumption per m^2 was calculated for the total heated area rather than the area for which housing subsidies were granted (i.e. area within established consumption norms);
2) Average actual gas consumption for cooking per capita: $G_p = V/N$;
3) Average actual gas consumption for cooking and heating water per capita: $G_q = V_q/N$.

Data on gas consumption in Kam'yanets-Podilsky raion of Khmelnitska oblast is shown in two tables: Table 2.3 (data on heating and cooking) and Table 2.4 (data on heating, cooking, and heating water). Similar data on Yahotynsky raion of Kyivska oblast are compiled in Tables 2.5 and 2.6, respectively.

The number of households using natural gas for heating, cooking, and heating water in Yahotynsky raion was smaller than that in Kam'yanets-Podilsky raion.

The small number of subsidy recipients and the low level of natural gas consumption in Yahotynsky raion in April 1998 reflects the early end of the heating season. As they reduced use of natural gas, some households lost their eligibility for housing subsidies and other households were granted subsidies based on half consumption norms. For this reason, we did not include data on Yahotynsky raion for April 1998 in the aggregate data.

Table 2.7 shows aggregate data (average values for the heating season).

Therefore, the actual consumption of gas by

Table 2.1: Actual Gas Consumption During the 1997-98 Heating Season in Kam'yanets-Podilsky Raion (Metered Households)

	Volume of Gas (m^3)	*Subsidies for Gas, Hrn.*
Normative gas consumption during the heating season	3,556,211.25	351,013.17
Actual consumption	2,746,854.22	269,972.45
Saved gas	809,357.03	X
Budget funds returned	X	81,040.72
Saving relative to normative consumption (percent)	22.76	23.09

Table 2.2: Actual Gas Consumption During the 1997-98 Heating Season in Yahotynsky Raion (Metered Households)

	Volume of Gas (m^3)	*Subsidies for Gas, Hrn.*
Normative gas consumption during the heating season	14,297,662.22	1,381,142.72
Actual consumption	10,120,303.14	986,113.12
Saved gas	4,177,359.08	X
Budget funds returned	X	395,029.62
Saving relative to normative consumption (percent)	29.22	28.60

households receiving housing subsidies is as follows:

1) Gas for heating: 5.7 m^3 to 6.8 m^3 per m^2 of heated area which is far below the established normative of 11 m^3 per m^2;
2) Gas for cooking: 13.0 m^3 to 13.9 m^3 per capita which is also below the existing normative of 18.3 m^3 per capita;
3) Gas for cooking and heating water: 16.5 m^3 to 18.5 m^3 per capita – again, far below the established normative of 23.6 m^3 per capita.

Considerable discrepancy between actual gas consumption per heated area unit by households with water heaters (5.7 m^3 to 6.4 m^3) and without water heaters (6.7 m^3 to 6.8 m^3) is explained by the unreasonable "weight" of the water heater component in gas consumption normatives.

2.4 Conclusions

Two important conclusions follow from the results of the analysis:

1) The increase in gas heating normatives required under Cabinet of Ministers Decree No.619, issued in June 1996 by Prime minister Lazarenko, was inappropriate. It has required households to pay for much more gas than they actually use. The decree raised the volume of gas for which households were billed per m^2 of heating space by 28.3% – about the level by which measured consumption exceeds normative consumption in the two raions (22.8% in Kam'yanets-Podilsky raion and 29.2% in Yahotynsky Raion). The decree would have been appropriate if it had been coupled with a program to provide low-income households with assistance to install gas meters.
2) The difference between the actual and normative consumption of gas underestimates the potential savings in gas consumption that will result from the installation of meters. The households in the database used for measuring metered use were all receiving housing subsidies. For almost all these households, the financial benefit of reducing gas consumption is zero. The value of reduced consumption accrues entirely to the housing subsidy program.

Table 2.3: Estimated Consumption Norms for Natural Gas for Heating and for Cooking (and not for Heating Water) Calculated for Kam'yanets-Podilsky Raion in Khmelnytska Oblast

		October 97	November 97	December 97	January 98	February 98	March 98	April 98
Number of households		391	489	543	583	609	607	603
Number of persons	N	1,112	1,430	1,610	1,745	1,836	1,825	1,822
Normative housing floor area	S_n	23,480.20	29,917.60	33,597.00	36,140.44	37,797.70	37,608.30	37,479.50
Total heated floor area	S_a	30,205.37	37,922.37	42,495.57	45,554.41	47,523.57	47,424.37	47,186.27
Total normative volume of gas	V_n	278,631.80	355,262.60	399,030.00	429,478.34	449,373.50	447,088.80	445,617.10
Normative volume of gas for heating	V_{on}	258,282.20	329,093.60	369,567.00	397,544.84	415,774.70	413,691.30	412,274.50
Normative volume of gas for cooking	V_{pn}	20,349.60	26,169.00	29,463.00	31,933.50	33,598.80	33,397.50	33,342.60
Volume of gas actually consumed	V_a	215,011.44	273,379.19	307,825.24	330,884.29	345,474.04	343,761.32	341,912.10
Volume of gas actually consumed for heating	V_o	199,462.34	253,433.14	285,322.39	306,538.00	319,912.53	318,372.24	316,619.06
Volume of gas actually consumed for cooking	V_p	15,549.10	19,946.05	22,502.85	24,346.29	25,561.51	25,389.08	25,293.04
Average actual gas consumption for heating per m^2 of heating space	G_o	6.60	6.68	6.71	6.73	6.73	6.71	6.71
Average actual per capita natural gas consumption for cooking	G_p	13.98	13.95	13.98	13.95	13.92	13.91	13.88

Table 2.4: Estimated Consumption Norms for Natural Gas for Heating and for Cooking and for Heating Water Calculated for Kam'yanets-Podilsky Raion in Khmelnytska Oblast

Variable definition and symbol		October 97	November 97	December 97	January 98	February 98	March 98	April 98
Number of households		117	132	137	137	138	138	137
Number of persons	N	354	395	412	415	417	420	419
Normative housing floor area	S_n	8,100.90	9,059.60	9,362.10	9,402.20	9,454.70	9,517.70	9,486.20
Total heated floor area	S_a	12,533.90	13,932.90	14,355.30	14,360.70	14,290.70	14,326.00	14,276.00
Total normative volume of gas	V_n	97,464.30	108,977.60	112,706.30	113,218.20	113,842.90	114,606.70	114,236.60
Normative volume of gas for heating	V_{on}	89,109.90	99,655.60	102,983.10	103,424.20	104,001.70	104,694.70	104,348.20
Normative volume of gas for cooking and heating water	V_{pn}	8,354.40	9,322.00	9,723.20	9,794.00	9,841.20	9,912.00	9,888.40
Volume of gas actually consumed	V_a	77,108.26	86,765.36	89,204.11	89,521.94	89,265.21	89,211.25	88,864.75
Volume of gas actually consumed for heating	V_o	70,537.61	79,403.12	81,568.88	81,837.82	81,599.83	81,543.62	81,219.22
Volume of gas actually consumed for cooking and heating water	V_p	6,570.65	7,362.24	7,635.23	7,684.12	7,665.38	7,667.63	7,645.53
Average actual gas consumption for heating per m^2 of heating space	G_o	5.63	5.70	5.68	5.70	5.71	5.69	5.69
Average actual per capita natural gas consumption for cooking and heating water	G_p	18.56	18.64	18.53	18.52	18.38	18.26	18.25

Table 2.5: Estimated Consumption Norms for Natural Gas for Heating and for Cooking (and not for Heating Water) Calculated for Yahotynsky Raion of Kyivska Oblast

Variable definition and symbol		October 97	November 97	December 97	January 98	February 98	March 98	April 98
Number of households		2,966	3,087	3,255	3,360	3,396	3,337	333
Number of persons	N	6,428	6,733	7,276	7,544	7,656	7,526	1,000
Normative housing floor area	S_n	168,495.64	175,297.23	186,129.83	192,321.26	194,570.34	190,949.48	20,495.43
Total heated floor area	S_a	193,641.32	201,568.32	213,918.21	221,116.61	223,559.11	219,438.01	23,695.20
Total normative volume of gas	V_n	1,971,084.44	2,051,483.43	2,180,578.93	2,253,589.06	2,280,378.54	2,238,170.08	243,731.43
Normative volume of gas for heating	V_{on}	1,853,452.04	1,928,269.53	2,047,428.13	2,115,533.86	2,140,273.74	2,100,444.28	225,449.73
Normative volume of gas for cooking	V_{pn}	117,632.40	123,213.90	133,150.80	138,055.20	140,104.80	137,725.80	18,281.70
Volume of gas actually consumed	V_a	1,392,163.03	1,454,269.83	1,548,766.75	1,605,715.73	1,631,024.71	1599,859.81	131,828.17
Volume of gas actually consumed for heating	V_o	1,308,913.89	1,366,696.42	1,453,928.56	1,507,065.85	1,530,568.65	1501,185.50	121,850.18
Volume of gas actually consumed for cooking	V_p	83,249.14	87,573.41	94,838.19	98,649.88	100,456.06	98,674.31	9,977.99
Average actual gas consumption for heating per m^2 of heating space	G_o	6.76	6.78	6.80	6.82	6.85	6.84	5.14
Average actual per capita natural gas consumption for cooking	G_p	12.95	13.01	13.03	13.08	13.12	13.11	9.98

Table 2.6: Estimated Consumption Norms for Natural Gas for Heating and for Cooking and Heating Water Calculated for Yahotynsky Raion of Kyivska Oblast

Variable definition and symbol		October 97	November 97	December 97	January 98	February 98	March 98	April 98
Number of households		64	68	74	81	78	74	4
Number of persons	N	177	191	210	234	226	214	10
Normative housing floor area	S_n	4,179.94	4,416.44	4,824.91	5,294.39	5,109.89	4,815.89	269.75
Total heated floor area	S_a	5,069.40	5,340.40	5,892.40	6,385.40	6,200.40	5,821.40	298.50
Total normative volume of gas	V_n	50,156.54	53,088.44	58,030.01	63,760.69	61,542.39	58,025.19	3,203.25
Normative volume of gas for heating	V_{on}	45,979.34	48,580.84	53,074.01	58,238.29	56,208.79	52,974.79	2,967.25
Normative volume of gas for cooking and heating water	V_{pn}	4,177.20	4,507.60	4,956.00	5,522.40	5,333.60	5,050.40	236.00
Volume of gas actually consumed	V_a	35,328.65	37,100.46	41,260.85	45,914.37	43,700.71	40,919.44	1,719.63
Volume of gas actually consumed for heating	V_o	32,424.97	34,002.86	37,784.46	41,982.13	39,961.02	37,404.12	1,592.63
Volume of gas actually consumed for cooking and heating water	V_p	2,903.68	3,097.60	3,476.39	3,932.24	3,739.69	3,515.32	127.00
Average actual gas consumption for heating per m^2 of heating space	G_o	6.40	6.37	6.41	6.57	6.44	6.43	5.34
Average actual per capita natural gas consumption for cooking and heating water	G_p	16.40	16.22	16.55	16.80	16.55	16.43	12.70

Table 2.7: Average Actual Consumption of in the Heating Season of 1997-1998 (m^3)

	Kam'yanets-Podilsky raion	*Yahotynsky raion*
Heating + cooking		
Number of households*	609	3,396
Gas consumption for heating (m^3 per m^2)	6.70	6.81
Gas consumption for cooking (m^3 per capita)	13.94	13.05
Heating + cooking + heating water		
Number of households*	138	81
Gas consumption for heating (m^3 per m^2)	5.69	6.44
Gas consumption for cooking (m^3 per capita)	18.45	16.49

* Note to Table 2.7: Since the number of enrolled households changes every month during the heating season the table shows the maximum number of households which applied for subsidies during one month.

3. ANALYSIS OF THE COST OF EXCESSIVE GAS NORMATIVES FOR THE HOUSING SUBSIDY PROGRAM NATIONWIDE

PADCO's second task was to identify "the natural gas component," or share, in the cost of the Housing Subsidy Program. This was done based on information in the pilot housing subsidy database.

3.1 Introduction

Most households – up to 80 percent of all Ukrainian households that use gas – have not yet installed meters. They pay, therefore, according to normatives established by the Cabinet of Ministers Decree. The analysis in the previous section of this report shows that these unmetered households pay for more gas than they actually use. Also, they use more gas than would be the case if they were to install meters and be required to pay the full price for gas actually used. Consequently, both households and local budgets pay for gas that is not actually consumed. Local budgets spend for *unused* gas through transfers to gas providers to cover housing subsidies granted to low-income families.

3.2 The Database from 32 Pilot Raions

Not all housing subsidy offices – even those in the pilot raions – maintain information on the level of services used by households applying for and receiving subsidies. The NASH DIM software program, developed by PADCO for the Ministry of Labor and Social Policy, allows detailed information to be maintained by local offices. But many local offices have chosen not to use the full capacities of the program.

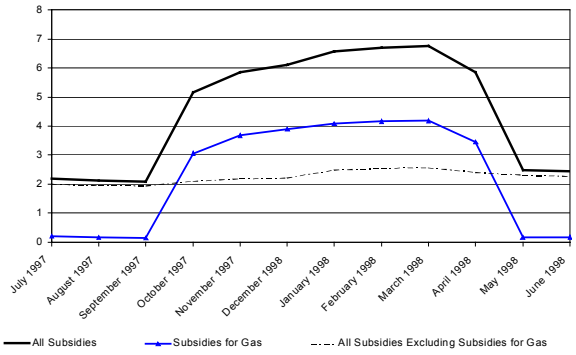
Of the 221,883 households enrolled in the housing subsidy program in the 32 pilot raions in June 1998, data on the level of housing and communal services actually used were maintained for only 66,915 households. Data on consumption of liquid gas and solid fuel was registered for only 6,249 households, and for 153,840 households no data on individual services were maintained.[13]

Data on consumption of housing and communal services and values of subsidies granted between July 1997 and June 1998 is shown in Table 3.1. This table separates the total value of subsidies for communal services from data on natural gas consumption.[14] Chart 3.1 (derived from Table 3.1) shows monthly values of total subsidies and subsidies for natural gas in the pilot raions database. The dotted line shows total subsidies excluding those granted to cover the costs of natural gas due. The value of monthly subsidies due between July 1997 and June 1998 (without subsidies for natural gas) ranged between 2.0 million hrn and 2.5 million hrn.

The chart shows the large seasonal increase in the value of subsidies at the beginning of the heating season and the corresponding fall at the end of the season. Subsidies for natural gas during the heating season were twice as large as subsidies for all other services combined. That is, two thirds of the cost of the housing subsidy program during the heating season is attributable to billing for gas.

Between November and March, the monthly value of subsidies for natural gas ranged from 3.8 million hrn to 4.2 million hrn. In October and April, it fell to between 3 million hrn and 3.4 million hrn because in some regions the heating season begins in mid October and ends in mid April (see Chart 3.1). By comparison, monthly transfers from local budgets to cover subsidies for other services show little seasonal variation.

Chart 3.1: Monthly Values of Subsidies, 32 Pilot Raions, (Million Hrn)



In October 1997, at the beginning of the heating season, subsidies for households were estimated based on consumption norms rather than actual consumption. For metered households, subsidies were recalculated at the end of the heating season based upon the actual amount of gas used. These households were required to present their gas bills to the housing subsidy office. The housing subsidy office then recalculated the amount of subsidies due to the local gas provider based on these records. This resulted in a substantial reduction in the amount due from local budgets to gas providers from the amount calculated at the beginning of the heating season. Estimates of the total "overpayment" from local budgets to local gas providers are made in the following Section of this report.

3.3 Comparison with Yahotynsky and Kam'yanets-Podilsky raions

For comparison, we also compiled separate tables (3.2 and 3.3) with data on gas consumption in Yahotynsky and Kam'yanets-Podilsky raions. In these raions, services are registered automatically when granting subsidies. Charts 3.2 and 3.3 illustrate the behavior of indicators. As in the case of the 32 pilot raions (see Subsection 3.2), there is notable increase in consumption of natural gas during the heating season and relatively stable behavior of subsidies for other services (excluding natural gas). Since both are rural raions, the value of subsidies for these other services is relatively small as compared to the value of subsidies for natural gas.

[13] Note that some households receive subsidies for both housing and communal services and liquid gas and solid fuel. Regulations on granting housing subsidies do no require identification of individual services consumed by enrolled households.

[14] The data were compiled according to records of payments to communal services enterprises. As a rule, there are UkrGas contractors providing natural gas for heating in each raion. Therefore, our task was reduced to identification of a natural gas provider in each pilot raion, calculation of values of subsidies granted and numbers of subsidy recipients. Gas providers were easy to identify by searching the pilot raions database by name (for example, KhmelnytskGas, TernopilGas, KyivOblGas, DonetskOblGas etc.). Correctness of search results was checked by telephone verification in each pilot HSO.

Table 3.1: Total Monthly Values of Subsidies, 32 Pilot Raions

No.	*Month*	*All Services*			*Gas for heating*			*Monthly Values of Subsidies for Services Excluding Natural Gas (hrn 000)*
		Number of Households	*Monthly Charges Based on Consumption Normative (hrn 000)*	*Monthly Value of Subsidies (hrn 000)*	*Number of Households*	*Monthly Charges Based on Consumption Normative (hrn 000)*	*Monthly Values of Subsidies (hrn 000)*	
1	July 97	73,293	3,576.35	2,196.95	8,334	330.86	203.06	1,993.89
2	August 97	71,076	3,455.54	2,115.71	7,058	277.22	164.64	1,951.06
3	September 97	70,580	3,428.05	2,084.84	6,455	256.57	149.72	1,935.12
4	October 97	125,301	7,730.55	5,161.78	52,990	4,276.72	3,061.06	2,100.72
5	November 97	136,433	8,723.68	5,852.69	60,853	5,134.00	3,676.61	2,176.08
6	December 97	141,483	9,118.91	6,109.42	64,249	5,450.33	3,894.18	2,215.23
7	January 98	147,342	9,490.72	6,564.87	67,102	5,712.13	4,081.32	2,483.56
8	February 98	152,107	9,695.96	6,700.06	68,411	5,823.68	4,162.53	2,537.52
9	March 98	155,155	9,783.75	6,750.26	68,846	5,854.66	4,184.67	2,565.59
10	April 98	145,271	8,606.46	5,848.63	60,260	4,881.06	3,445.77	2,402.85
11	May 98	82,354	3,793.37	2,477.41	7,294	288.87	168.29	2,309.12
12	June 98	81,761	3,747.47	2,443.51	7,146	297.96	176.22	2,267.29

Note to Table 3.1: Data on the heating season are shaded.

Table 3.2: Monthly Values of Subsidies in Kam'yanets-Podilsky Raion in the Heating Season of 1997-1998

Month		*Subsidies for All Services*		*Subsidies for Natural Gas*		*Monthly Value of Subsidies Excluding Gas, hrn*
		Number of Households	*Monthly Value of Subsidies, hrn*	*Number of Households*	*Monthly Value of Subsidies, hrn*	
1	July 97	468	13,410.70	111	1,066.73	12,343.97
2	August 97	440	12,779.36	87	970.18	11,809.18
3	September 97	413	12,072.88	68	909.10	11,163.78
4	October 97	1,218	57,369.67	844	43,570.07	13,799.60
5	November 97	1,359	65,706.37	986	51,570.68	14,135.69
6	December 97	1,427	70,911.47	1,056	55,997.43	14,914.04
7	January 98	1,480	74,051.98	1,103	58,564.83	15,487.15
8	February 98	1,542	76,997.31	1,133	60,241.03	16,756.28
9	March 98	1,546	76,314.27	1,126	59,427.71	16,886.56
10	April 98	1,544	76,506.95	1,125	59,450.90	17,056.05
11	May 98	481	14,307.49	94	1,831.52	12,475.97
12	June 98	461	13,438.68	87	1,829.23	11,609.45
Total (12 months)		x	563,867.13	x	395,429.41	168,437.72
Total (heating season)		x	497,858.02	x	388,822.65	109,035.37
Total (non-heating season)		x	66,009.11	x	6,606.76	59,402.35
Monthly average, heating season		x	71,122.57	x	55,546.09	15,576.48
Monthly average, non-heating season		x	13,201.82	x	1,321.35	11,880.47

Note to Table 3.2: Data on the heating season are shaded

Table 3.3: Monthly Values of Subsidies in Yahotynsky Raion in the Heating Season

Month		Subsidies for All Services		Subsidies for Natural Gas		Monthly Values of Subsidies Excluding Gas, hrn
		Number of Households	Monthly Value of Subsidies, hrn	Number of Households	Monthly Value of Subsidies, hrn	
1	July 97	1,377	29,657.09	448	4,286.76	25,370.33
2	August 97	1,245	28,695.99	335	3,995.94	24,700.05
3	September 97	1,135	27,803.16	229	3,629.46	24,173.70
4	October 97	6,979	318,696.05	5,869	289,026.11	29,669.94
5	November 97	7,447	343,440.26	6,292	313,503.07	29,937.19
6	December 97	7,722	358,824.03	6,549	328,714.73	30,109.30
7	January 98	8,034	372,950.99	6,843	342,877.17	30,073.82
8	February 98	8,097	376,091.08	6,899	346,476.17	29,614.91
9	March 98	7,985	371,216.50	6,783	341,133.83	30,082.67
10	April 98	2,302	52,898.41	1,261	27,487.47	25,410.94
11	May 98	1,615	32,019.33	322	4,190.14	27,829.19
12	June 98	1,594	33,113.39	303	5,087.51	28,025.88
Total (12 months)		x	2,345,406.28	x	2,010,408.36	334,997.92
Total (heating season)		x	2,194,117.32	x	1,989,218.55	204,898.77
Total (non-heating season)		x	151,288.96	x	21,189.81	130,099.15
Monthly average, heating season		x	313,445.33	x	284,174.08	29,271.25
Monthly average, non-heating season		x	30,257.79	x	4,237.96	26,019.83

Note to Table 3.3: Data on the heating season are shaded

Chart 3.2: Monthly Values of Housing Subsidies in Kam'yanets-Podilsky Raion (000 Hrn)

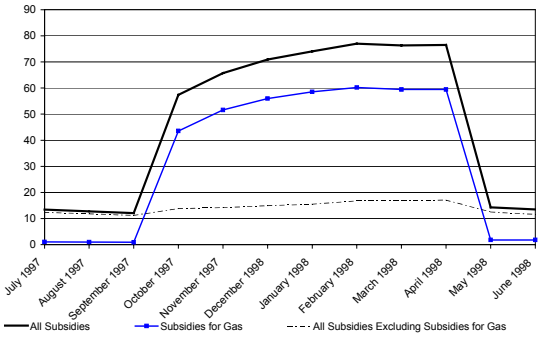
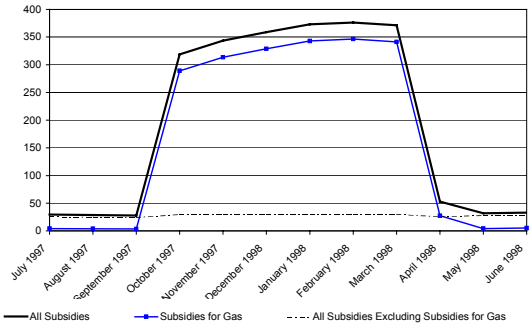


Chart 3.3: Monthly Values of Housing Subsidies Due in Yahotynsky Raion (000 Hrn)



4. NATIONWIDE ESTIMATES OF THE TOTAL PAYMENTS TO LOCAL PROVIDERS FOR GAS FROM THE HOUSING SUBSIDY PROGRAM

PADCO's third task was to estimate "the gas component" in the total cost of the Housing Subsidy Program. This was done by extrapolating estimates calculated for 32 pilot raions to Ukraine as a whole based on the total number of enrolled households and total amount of housing subsidies. In addition, we used the actual consumption level (see Section 2) and estimated "gas component" to estimate potential saving of budget funds.

4.1 Making Nationwide Estimates from Sample Data

The nationwide value of subsidies for natural gas was calculated based on:

1) Nationwide data from reports prepared by the State Committee for Statistics on values of subsidies and number of subsidy recipients. These data cover the same period – July 1997 through June 1998 – used in the preceding two sections of this report (see Table 4.1);

2) Data on subsidies for natural gas in 32 pilot raions (see Table 3.1).

Table 4.2 shows results of these calculations. The estimates in Columns 8, 9 of Table 4.2 were made by extrapolating subsidies for natural gas in pilot raions nationwide.

Chart 4.1, based on the data in Table 4.2, shows monthly total values of subsidies and estimated values of subsidies for natural gas for Ukraine as a whole.

4.2 Estimates of Total Value of Subsidies for Gas

Table 4.2 shows that the total monthly values of subsidies due between July 1997 and June 1998 for all communal services, including natural gas, varied between 64 million hrn and 161 million hrn. The monthly values of subsidies excluding subsidies for natural gas ranged from 50 million hrn to 64 million hrn over this period.

During the peak of the heating season (December through March), monthly subsidies for natural gas ranged from 97 million hrn to 100 million hrn. In the "shoulder months" – October, November, and April – monthly subsidies for natural gas were smaller (between 55 million hrn and 85 million hrn) because, in southern regions, the heating season is shorter (see Chart 4.1). The lower value of subsidies at the beginning of the heating season is also explained by the fact that many subsidies for October are not granted and credited until November (according to *Decree No. 1050, Item 13, Paragraph 7*).

Monthly subsidies for natural gas to households whose homes have central heating and which use gas only for cooking averaged between 4.6 million hrn. and 7.3 million hrn during all seasons. Values of subsidies to these households are represented by a dashed line in Chart 4.1. These subsidies would not change by very much if meters were to be installed and for this reason are excluded from the analysis. In fact, for many of these households, installing meters is not cost effective – see Section 5, below.

Subsidies for natural gas totaled 647 million hrn between July 1997 and June 1998. The total value of subsidies for natural gas during the non-heating season was 27 million hrn -- averaging 5.45 million hrn per month. If we assume that the value of subsidies to these households during the heating season is for households using natural gas for heating, then the total value of subsidies for natural gas for the whole heating season 1997-98 would be around 581.6 million hrn. If gas meters were installed, the analyses in the previous sections indicate that gas consumption would decline by between 22.76 percent to 29.22 percent. This would allow a saving of between 23.1 percent to 28.6 percent in budget expenditures for subsidies for natural gas or between 134.2 million hrn and 166.3 million hrn.

Table 4.1 also shows the officially reported number of households enrolled in the HSP. On average, 2.815 million households receive subsidies during the non-heating season and 3.854 million households during the heating season. The difference – 1.039 million households – are, we assume, those who use natural gas for home heating. If the cost of a gas meter and its installation is about 250 hrn, then the cost of installing gas meters by all enrolled households is 259.7 million hrn. The cost of meter installation could be repaid, through lower costs to local budgets from reduced housing subsidy payments, within two years from the reduction in monthly payments for natural gas. The following section of this report estimates the "payback" period for different types of households.

Table 4.1: Value of Housing Subsidies and Number of Participants, Nationwide*

No.	*Month*	*Total Value of Subsidies for Housing and Communal Services (000 hrn)*	*Number of Households Enrolled in the HSP*
1	July 97	79,055.50	3,028,778
2	August 97	69,713.70	2,990,382
3	September 97	67,322.80	3,057,099
4	October 97	93,248.70	3,548,120
5	November 97	135,203.20	4,068,923
6	December 97	159,998.90	4,477,519
7	January 98	156,892.00	3,584,584
8	February 98	160,922.00	3,771,833
9	March 98	160,639.50	3,863,124
10	April 98	136,597.80	3,667,996
11	May 98	74,377.10	2,559,582
12	June 98	64,280.70	2,439,579
	Cumulative Total	**1,358,251.90**	x

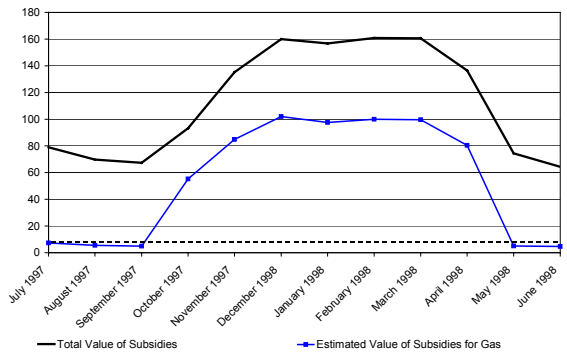
* From monthly statistical reports on the housing subsidy program prepared by the State Committee for Statistics.
Note to Table 4.1: Data on the heating season are shaded.

Table 4.2: Estimated Values of Subsidies for Natural Gas, Nationwide

No.	*Month*	*Pilot Raions*				*Ukraine As a Whole*		
		Total Value of Subsidies Granted (000 hrn)	*Value of Subsidies for gas (000 hrn)*	*Subsidies for gas as % of total*	*Total Value of Subsidies excluding gas (000 hrn)*	*Total Value of Subsidies Granted (000 hrn)*	*Estimated Value of Subsidies for Gas (000 hrn)*	*Estimated Value of Subsidies excluding gas (000 hrn)*
1	July 97	2,196.95	203.06	9.24	1,993.89	79,055.50	7,307.08	71,748.42
2	August 97	2,115.71	164.64	7.78	1,951.06	69,713.70	5,425.08	64,288.62
3	September 97	2,084.84	149.72	7.18	1,935.12	67,322.80	4,834.63	62,488.17
4	October 97	5,161.78	3,061.06	59.30	2,100.72	93,248.70	55,298.77	37,949.93
5	November 97	5,852.69	3,676.61	62.82	2,176.08	135,203.20	84,933.49	50,269.71
6	December 97	6,109.42	3,894.18	63.74	2,215.23	159,998.90	101,984.39	58,014.51
7	January 98	6,564.87	4,081.32	62.17	2,483.56	156,892.00	97,538.16	59,353.84
8	February 98	6,700.06	4,162.53	62.13	2,537.52	160,922.00	99,975.79	60,946.21
9	March 98	6,750.26	4,184.67	61.99	2,565.59	160,639.50	99,584.88	61,054.62
10	April 98	5,848.63	3,445.77	58.92	2,402.85	136,597.80	80,477.90	56,119.90
11	May 98	2,477.41	168.29	6.79	2,309.12	74,377.10	5,052.46	69,324.64
12	June 98	2,443.51	176.22	7.21	2,267.29	64,280.70	4,635.77	59,644.93
Total (twelve months)		54,306.13	27,368.09	50.5	26,938.04	1,358,251.90	647,048.41	711,203.49
Total (heating season)		42,987.71	26,506.16	61.66	16,481.55	1,003,502.10	619,793.37	383,708.73
Total (non-heating season)		11,318.42	861.94	7.62	10,456.48	354,749.80	27,255.03	327,494.77
Monthly average, heating season		6,141.10	3,786.59	61.66	2,354.51	143,357.44	88,541.91	54,815.53
Monthly average, non-heating season		2,263.68	172.39	7.62	2,091.30	70,949.96	5,451.01	65,498.95

Note to Table 4.2: Data on the heating season are shaded.

Chart 4.1: Estimated Values of Subsidies for Natural Gas Granted Nationwide (Million Hrn)



5. COST EFFECTIVENESS OF INSTALLING GAS METERS BY HOUSEHOLDS

5.1 Introduction

Each household should decide on its own whether to install a gas meter. The following major categories may be identified among households which use natural gas for heating:

1) Households which are going to connect their housing to a gas supply system. It should be noted that households will not be connected to the gas supply system unless they install gas meters. In other words, such households will have to install gas meters;
2) Households which are not eligible for housing subsidies because they do not meet program income requirement. These households will be interested in installing gas meters (and, most probably will install gas meters) since they have a strong economic incentive;

Table 5.1: Estimated Monthly Mandatory Payments and Values of Subsidies for Two Households Which Consume Gas at 25 Percent Below the Normative Level

	Household 1		*Household 2*	
Gas consumed (m^3)	783.2	549.9	696.6	522.459
Charges for gas (hrn.)	128.31	96.23	60.95	45.71
Mandatory portion of payment	20% 50 hrn.	20% 50 hrn.	15% 18 hrn.	15% 18 hrn.
Subsidy (hrn)	78.31	46.23	42.95	27.71
Gas conserved (%)	25		25	
Mandatory portion of payment in the next period		18% 45.0 hrn.		13% 15.6 hrn.
Renewed subsidy (hrn.)		51.23 hrn.		30.11 hrn.

3) Low income households receiving housing subsidies. These households do not have any economic incentives to install gas meters since the Government pays a considerable portion of their charges for housing and communal services (consumed natural gas). For this reason most of households in this category have not yet installed and are not willing to install gas meters.

A special comment should be made on households using natural gas only for cooking (or for cooking and heating water). They consume only 18.3 m^3 and 23.6 m^3 per person per month, respectively. Most of these households do not have meters. However, the economic incentive to install meters for these households is also much smaller than that for households that use natural gas for heating.

Today low-income households account for a large portion of residential customers who do not meter consumption of natural gas. Most of them receive housing subsidies. The results of analysis of housing subsidy databases (see preceding sections) show that actual gas consumption is far below official norms of consumption used as the basis to calculate charges for natural gas and housing subsidies.

The question is: what how can housing subsidy recipients be encouraged to install gas meters?

5.2 Specific Aspects of Granting Subsidies to Households Which Meter Gas Consumption

The current mechanism for granting housing subsidies to residential customers guarantees that the Government will pay a considerable percentage of the cost of services provided to low income households. However, it does not encourage households to conserve gas and, thus, to install gas meters. To the contrary, the mechanism that was effective between 1997 and 1999 complicated the application procedure for households who had installed meters. For example, if a household conserved a certain amount of gas (so that the cost of consumed gas dropped below the mandatory payment), it had to pay even for gas it had not consumed (i.e. under any circumstances households had to pay a certain fixed amount of money). That discouraged households from participation in the HSP.

Besides, there was another negative effect. Since eligibility for a next heating season was defined based on actual gas consumption, which was below that calculated from the mandatory payment, such households were disqualified from the HSP. In other words, HSOs did not grant subsidies to households who had been successful in conserving gas. In so doing, factors affecting the amount of consumption (such as, for example, a warm winter) were not taken into consideration.

Obviously, on comprehending the mechanism for granting subsidies, most residential consumers of natural gas realized that it was better to consume as much as discounted gas as possible under the HSP rather than to conserve gas. They also concluded that there was no sense in installing gas meters while they received housing subsidies.

To some extent, these conclusions related to households residing in large housing since subsidies are granted only for a floor area within existing consumption norms. However, as the results of the analysis reported above show, many households in this category consist exclusively of pensioners and people unable –to work. And under the current legislation, such households are eligible for a number of privileges including eligibility for subsidies for the total floor area of a housing unit. Therefore, these households are not interested in conserving gas or in installing gas meters.

A comparative analysis of consumption of natural gas for heating purposes will probably show an increase of actual gas consumption in the heating season of 1998-1999 as compared to the heating season of 1997-1998.

5.3 New Mechanism for Granting Subsidies

In May 1999, the Cabinet of Ministers of Ukraine issued Decree No. 822 «On Improving the Procedure for Granting Housing Subsidies to Residential Customers». This Decree implements proposals of the Ministry of Labor and Social Policy to encourage

more economical consumption of gas and other communal services.

For example, the Decree establishes that "if an enrolled household meters consumption of water, heat, gas, and electricity and housing subsidy to this household is renewed, the mandatory percentage of household's total income in payments for housing and communal services (20 percent or 15 percent) will be reduced by one percent for each ten percent of the difference between the cost normative consumption level and the cost of actual consumption during the last subsidy period; in so doing such reduction cannot exceed five percent…"

Therefore, the Decree is intended to create conditions under which households will benefit from economizing on the consumption of services (their mandatory percentage of total income in payments for services will be reduced).

In addition, the Decree makes a number of amendments to the Regulations on Housing Subsidies.[15] From now on "…households will pay the actual cost of an individual service if the cost of actual consumption of this service is below the mandatory percentage of payment for this service…" (Item 7). This means that households will not have to pay for not consumed gas even if the cost of actual consumption is below the mandatory percentage of payments. In other words, the Decree introduced incentives for the more economical consumption of services.

By modifying the Regulations on Housing Subsidies, the following definition of eligibility of subsidies is established: "If a household meters gas, electricity, and heat, subsidy to this household will be calculated based on actual consumption of services; in so doing, the actual consumption taken for calculation purposes cannot exceed established consumption norms" (Item 6). If charges to a household for actual consumption are below the mandatory percentage of payments for housing and communal services then the household will be *eligible for subsidy* i.e. it will receive a notification of granting subsidy without indication of the amount of the subsidy, thus, having to pay for actual consumption of services within the mandatory percentage of payments. If this household increases consumption of services (within established norms) the HSO will calculate subsidy and reimburse service providers for the cost of services.

Therefore, Decree No. 822 eliminates the factors that had discouraged households from using services economically and from installing meters.

[15] See Modifications and Amendments to the Regulations on Housing Subsidies approved by Cabinet of Ministers Decree No. 822 dated May 14, 1999.

5.4 Installation of Gas Meters: Estimates of Pay Back Period

The question is whether these changes are sufficient to encourage households to install gas meters. First of all one should realize that as much as two years may pass before housing subsidy recipients compare payments with and without meters and recognize the full advantages of metering gas use.

Assume two households reside in similar 60 m^2 dwellings and use natural gas for heating and cooking. The first household consists of four people (two adults and two children); its total monthly income is 250 hrn. The other household consists of two pensioners whose total monthly income is 120 hrn and who are eligible for 50 percent discount for charges for services and housing subsidy for the total floor area. We also assume that actual gas consumption by both households is 25 percent below the normative value.

According to Table 5.1, conservation of gas results in 5 hrn. reduction of monthly mandatory payment for Household 1 and in 2.4 hrn. reduction for Household 2. Therefore, they will save during seven months of the heating season 35.0 hrn. and 16,8 hrn., respectively. Consequently, if the cost of installing a gas meter is 250 hrn., pay back periods to the households will be 7 years and 15 years, respectively. There estimates are to some extent overstated. In reality, pay back periods will be shorter depending on the total cost of services including unmetered services (such as water supply and maintenance of housing). Besides, the estimates do not allow for behavior of outside temperature.

Therefore, installation of a gas meter by an average household consisting of two working adults and two children and enrolled in the HSP may pay for itself within seven years. The pay back period for the household of pensioners will be fifteen years. *Therefore, for most low income households installation of gas meters is not cost effective, even with incentives introduced by Decree No. 822.*

However, as Section 4.2 shows, installation of meters may save between 134.3 million and 166.3 million hrn. of budget funds annually through reductions in housing subsidy payments. First of all, the Government must be interested in implementing a national program of installing gas meters by low income households on favorable terms. Even if meters were installed free of charge for low income households that use gas for heating, the savings in reduced housing subsidy payments would repay the government for the costs within two years. The families would also receive benefits on top of this.

The government might receive a positive effect from providing low income households with state subsidies for installation of meters requiring households that pay a part of the costs of meter installation.

5.5 Options for Installing Gas Meters

Urgency of the economical gas consumption program was recognized by Presidential Decree No. 1239/99, dated September 30, 1999, which specified a number of measures to protect low income people. In particular, it instructed the Cabinet of Ministers of Autonomous Republic of Crimea, oblast, Kyiv and Sevastopol city state administrations "to speed up installation of gas and water meters by low income households and to provide them with interest free loans for installing meters".

Obviously, many low income households will face economic problems. We believe that households consisting of pensioners and disabled individuals should be granted assistance to install meters on favorable terms. In so doing, some additional incentives should be introduced to encourage economical consumption of natural gas.

For example, all or part of the cost of purchase and installation of meters could be covered from the cost of housing subsidies saved due to metering gas. For example, assume a household does not meter gas which it uses for heating and cooking (and heating water). If eligible, it will be granted subsidy for gas based on existing consumption norms at the rate of S hrn per month or S_n hrn for the whole heating season. Assume also this household receives an interest free loan to the amount of P hrn. to be repaid within 24 months. If the subsidy calculated based on gas consumption during the heating season is S_r hrn, then the difference (S_n-S_r) will be credited toward repayment of the loan. Therefore, the household will repay the loan within 24 months (two heating seasons) or, if the subsidy is terminated or saving is small, the household will have to pay only the difference.

However, households applying for loans for purchase and installation of meters should be subject to the following restrictions:

- Loan for purchase and installation of a meter should be repaid within 24 months (rather than 36 months as is required for loans provided on general terms);
- Until the loan is repaid, a participating household will not be eligible for reduced percentage of the mandatory payment since the savings will be credited toward repayment of the loan.

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